

The Genus *Neurogomphus* Karsch (Odonata: Gomphidae)

by

ELLIOT PINHEY

National Museum, Bulawayo

INTRODUCTION

This paper is presented as an attempt to clarify the status of species in the African genus *Neurogomphus* Karsch (1890). The species have been confused in the past and one in particular, *N. martininus* (Lacroix), has been an enigma since its description.

Generic synonymy has been explained in the present author's catalogue (Pinhey, 1962: 179). *Karschiogomphus* Schouteden (1934) was apparently based on abnormal venation and *Oxygomphus* Lacroix (1921) differs from *Neurogomphus* chiefly in having the occipital plate straight posteriorly, as in *Notogomphus* Hagen (1858). References to all these generic names are to be found in the above-mentioned Catalogue.

Genus *NEUROGOMPHUS* Karsch

Neurogomphus Karsch, 1890, *Ent. Nachr.* **16**: 374, 380.

This genus has some affinities to *Notogomphus* Hagen, in general facies and, at least in some species, in the rather slow measured flight, frequently over grassland. The neurogomphine face, however, is more sloping, like *Phyllogomphus* Selys (1854) and the hind femora are not markedly elongated. The anal appendages of the male are rather similar but the inferiors are not *more* widely splayed than the superior appendages. In *N. chapini* (Klots) and a new species described below there are two pairs of well developed coloured antehumeral stripes on the thorax, which is the case in many notogomphines, but this is not so in other species of the genus under consideration. The straight rear-edge of the occipital plate is not consistent in this genus, in fact in most recorded species it is convex. The species are generally smaller and less robust than in *Phyllogomphus* and the foliations on segment 8 of the abdomen are much shorter and outspread than in the very broad, down-turned phyllogomphine foliations.

Important neurogomphine features include the forward sloping face without a distinct frontal crest; a strong constriction at the basal half of abdominal segment 10; the presence of a basal subcostal crossvein in the wings; and the anteriorly-turned hamules.

Key to the genus *Neurogomphus* Karsch

- 1 Face and frons all green; thorax with two green antehumeral stripes, the outer one complete; small species, the abdomen (without anal appendages) less than 36 mm . . . 2
- Labrum, clypeus and frons with brown or black bands; thorax with one or two antehumeral stripes but the outer one never complete; abdomen 35 to over 50 mm . . . 3
- 2 Occiput evenly rounded posteriorly, upturned medially; antehumeral stripes united dorsally, the inner stripe broadly fused to the mesothoracic collar . . . **featheri** spec. nov.
- Occiput straight posteriorly; inner antehumeral stripe short, fusiform, not joined either to outer stripe nor to collar **chapini** Klots
- 3 Thorax black dorsally and laterally, with single green antehumeral stripe joined to mesothoracic collar; the largest species, hindwing 44-45 mm . . . **fuscifrons** Karsch
- Thorax less black laterally and always with at least a partial outer antehumeral stripe; hindwing rarely as long as 43 mm 4
- 4 Occipital plate not convex posteriorly but notched, medially; thorax laterally mainly black with three green bands; outer antehumeral stripe reduced to a small triangle **martinicus** Lacroix
- Occipital plate convex posteriorly, not notched; thorax laterally green, with or without black sutural stripes 5
- 5 Side of thorax with complete broad black stripe on second lateral suture; occipital plate only moderately curved posteriorly, the mid-length scarcely longer than the lateral edges; outer antehumeral stripe a long triangle **uelensis** Schouteden
- Side of thorax with, at most, only an incomplete stripe on second lateral suture; occipital plate strongly curved, the mid-length much longer than the lateral edges . . . 6
- 6 Outer antehumeral stripe reduced to a minute triangle (free or almost free) at dorsal end; mesepimeron broadly black at ventral end **agilis** Martin
- Outer antehumeral stripe a well developed triangle, thickly joined at dorsal end to inner stripe; mesepimeron not broadly black at ventral end **wittei** Schouteden

Neurogomphus fuscifrons Karsch, fig. 1

Karsch, 1890, *Ent. Nachr.* **16**: 380.

♀-Holotype and ♂-allotype in Berlin Museum.

The ♂-allotype was very kindly loaned by Dr K. K. Günther, for examination. It bears three labels, a red "Typus" label, a blue locality label "N. Kamerun, Joh-Albrechtshöhe, III.96, L. Conradt S", and a white label with the following handwriting (probably by Karsch): "*Phyllogomphus fuscifrons* (Karsch) ♂, nicht = *aethiops*, Selys, von R. Sc. Liege XI, 1858, p. 371, Tab. 6, f. 5 (Type bei Kirby!)" . Karsch's reference here is to De Selys and Hagen (1858 : 371).

♂-Allotype: A large dark species with abdomen short, in comparison to the long wings — unlike other known species of the genus. Labium ochreous, labrum black with green laterobasal dots; anteclypeus and genae green, postclypeus black with narrow green basal line; frons green with black basal band and a black bar on anterior surface; vertex black, occipital plate slightly curved posteriorly.

Prothorax black with green anterior lobe and a very narrow, reduced green posterior lobe; median lobe with two pairs of yellow lateral spots and a pair of mid-dorsal, posterior dots. Synthorax (fig. 1a) black, with single continu-

ous green antehumeral stripe which is joined to the green mesothoracic collar. Sides black with only traces of greenish markings: a line on mesepimeron, a broken stripe above second lateral suture and an irregular area on the metepimeron. Ventral surface and the legs blackish.

Abdomen shortish, with moderate foliations on segment 8, as in *N. wittei* Fraser. Segment 1 yellowish with trace of black lateral marking; 2 all yellow, including the oreillets (fig. 1e); segment 3 yellow at base, black otherwise except a narrow mid-dorsal line and a short lateral streak; all the segments 4-10 black, as well as the anal appendages (fig. 1c), except for a yellow annulus on basal third of segment 8. Segment 10 constricted in basal half as in other species. Superior appendages robust, divergent, angled before the slender, up-turned apices but without lateral, subapical tooth. Accessory appendages (fig. 1e) normal for the genus.

Wings long, with blackish venation. Pterostigma brown, between black veins. Forewing with 20-21 Ax as well as a basal subcostal crossvein; 16-17 Px. Discoidal field of forewing with two rows, expanding below the nodus. Anal loop of hindwing irregular, basically of one divided cell. Membranule very narrow, dark brown.

Abdomen (without appendages) 47 mm, hindwing 44 mm, pterostigma 5 mm.

A female (fig. 8) attributed to this species by the present author (1961b: 48) is not this but an aberrant example of *Phyllogomphus schoutedeni* Fraser (1957: 29), a closely allied genus. This female has very reduced foliations on segment 8, but further examples taken subsequently (January, 1965) at the same localities (Katambora and Zambezi River, near Victoria Falls) have the large phyllogomphine foliations in this sex. This species, unlike *Neurogomphus fuscifrons*, has a reddish-brown thorax with a single yellow antehumeral stripe, instead of a black thorax with a green stripe. The Zambezi River must, therefore be deleted as a known locality for *N. fuscifrons* Karsch.

Neurogomphus martininus (Lacroix), fig. 2

Oxygomphus martininus Lacroix, 1921, *Ann Is Soc. linn. Lyon* 67: 48.

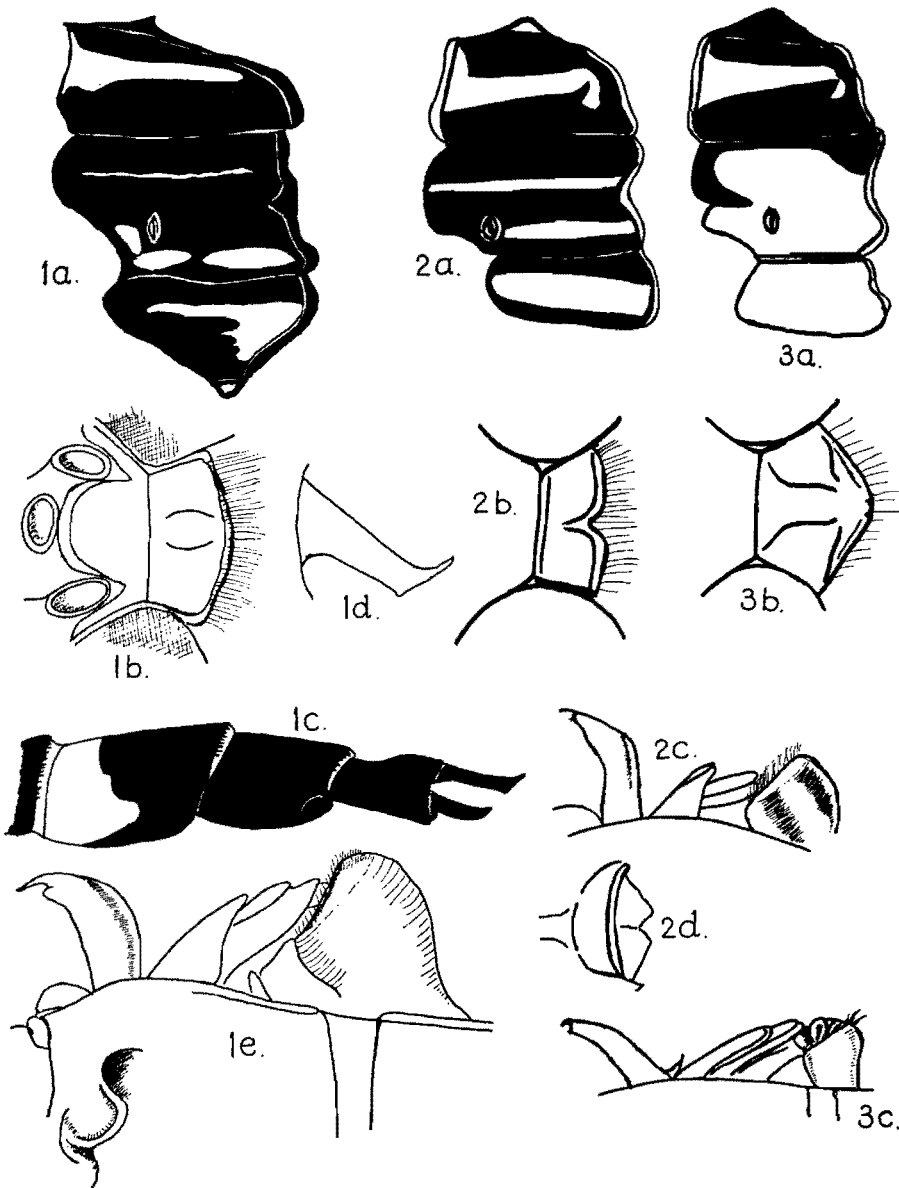
♀-Holotype (Bangui, Moyen Congo) is thought to be in a Mission in Santiago, Chile (teste Fraser in litt.). In general features the description of this

EXPLANATION OF FIGURES

Fig. 1. *Neurogomphus fuscifrons* Karsch, ♂-allotype. (a) Synthorax. (b) vertex and occipital plate. (c) segments 8-10 of abdomen and appendages. (d) left superior appendage, side view. (e) accessory genitalia, from right, with oreillets.

Fig. 2. *N. martininus* (Lacroix) (Kelle Forest). (a) Synthorax. (b) occipital plate. (c) accessory genitalia. (d) vulvar scales.

Fig. 3. *N. agilis* (Martin) (Kelle Forest). (a) Synthorax. (b) occipital plate. (c) accessory genitalia.



type agrees well with *N. ghesquieri* (Schouteden) which certainly occurs in the Moyen Congo, the only important feature omitted from the description being the shape of the occiput. It seems reasonable to consider the following synonymy: *Neurogomphus ghesquieri* (Schouteden, 1934 : 60). **syn. nov.**

♂-Holotype (Stanleyville) in Tervuren Museum.

MALE: This a large dark species. Face green, labrum brown, anteclypeus and anterior portion of postclypeus brown, frons black at base. Back of vertex without prominent tubercles. Occiput notched posteriorly (fig. 2b). Synthorax black with green Z-shaped antehumeral stripe and slender lateral stripes (fig. 2a). Segment 1 of abdomen green with broken black transverse bar, segment 2 all green; the rest of the abdomen black, but segments 3 and 8 with a green basal annulus. Abdomen, ♂♀, 45-52 mm, hindwing 38-42 mm.

A short series in the National Museum, Bulawayo, from Mekoum and Kelle Forests, Moyen Congo. The species occurs in both the equatorial Congo Republic forest areas.

Neurogomphus agilis (Martin), fig. 3

Notogomphus agilis Martin, 1908, *Annali Mus. civ. Stor. nat. Giacomo Doria* **43**: 657.

♂-Holotype (Portuguese Guinea) in Genoa Museum, ♀-allotype (Abyssinia, labelled "type") in Paris Museum.

This is a smaller species than *N. martinus* but also has a well developed inner antehumeral stripe and a small, triangular outer antehumeral mark, free or joined to the inner stripe (fig. 3a). The side of the thorax has reduced black marking, being mainly green. The face is marked as in *martinus*.

Abdomen 42-43 mm, hindwing 31-32 mm.

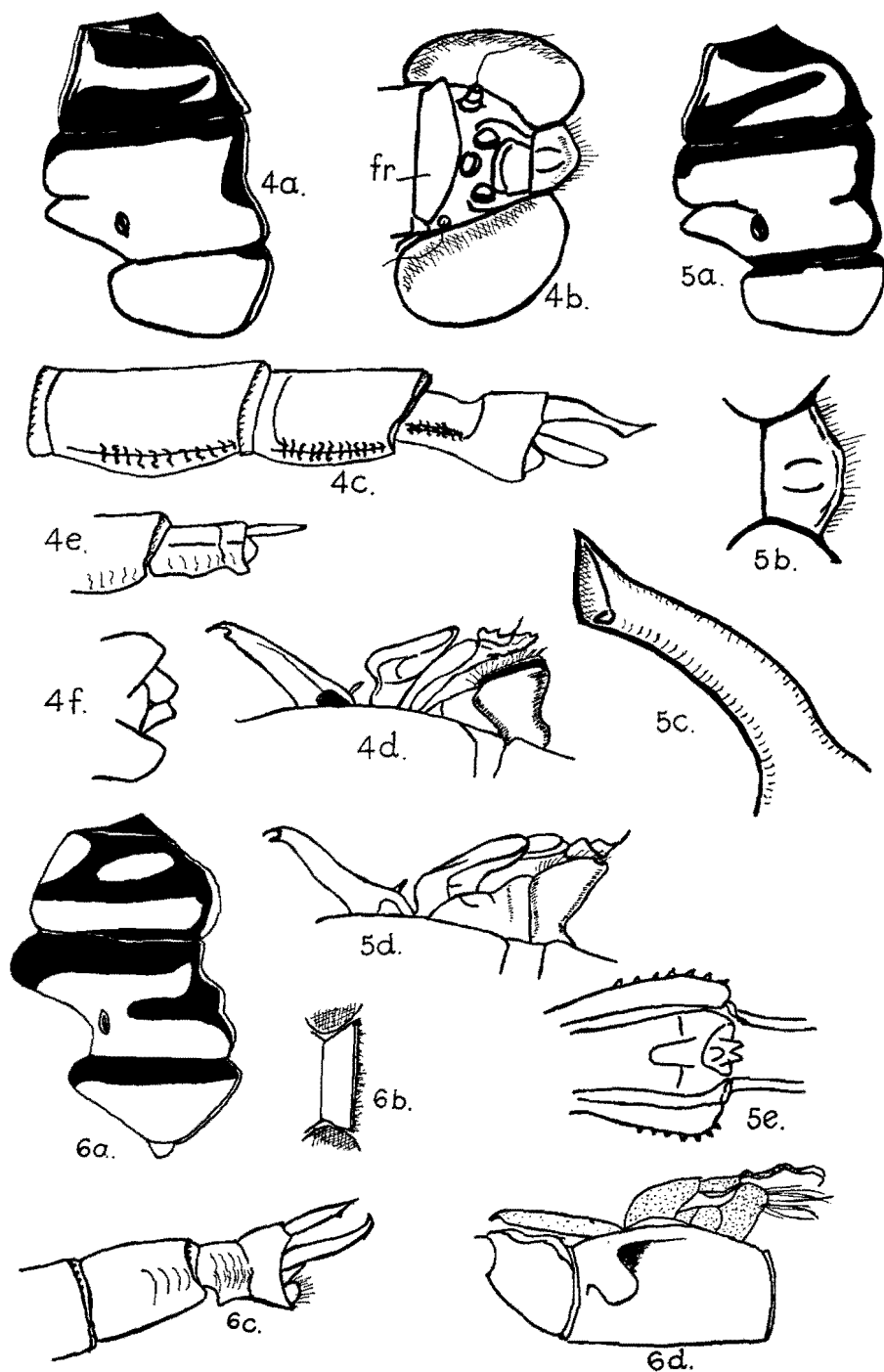
In the National Museum, Bulawayo, there is a male from Kelle Forest, Moyen Congo, in which the antehumeral markings are narrowly joined, unlike in the type.

EXPLANATION OF FIGURES

Fig. 4. *N. wittei* Schouteden (Zambezi River). (a) Synthorax. (b) vertex (fr = frons) (c) male, segments 8-10 of abdomen. (d) accessory genitalia. (e) female, segments 9-10 of abdomen. (f) vulvar scales.

Fig. 5. *N. uelensis* Schouteden (Zambezi River). (a) Synthorax. (b) occipital plate. (c) right superior appendage, from right. (d) accessory genitalia. (e) female, segment 8 of abdomen, ventrally.

Fig. 6. *N. chapini* (Klots) (Broderick Falls). (a) Synthorax. (b) occipital plate. (c) segments 9-10 of abdomen. (d) accessory genitalia.



Neurogomphus wittei Schouteden, fig. 4

Schouteden, 1934, *Ann. Is Mus. r. Congo belge*, 4to (b) 3(2) 3: 67.

♂-Holotype (Hoba, Katanga) and

♀-allotype (Kere-Kere, Kilo Distr., Congo: designated by Fraser) in Tervuren Museum.

Apart from the Congo this species is common on the Zambezi River near the Victoria Falls, generally in the months of April and May. It is very closely allied to *N. uelensis* and may even be a distinct seasonal form of that species. The face is green with dark markings as in *N. martinus*. The mesepisterna are black with two linked green antehumerals, the outer one short (fig. 4a). The side of the thorax is green, without a black stripe on second lateral suture.

Abdomen 35-40 mm, hindwing 29-30 mm.

Neurogomphus uelensis Schouteden, fig. 5

Schouteden, 1934, *Ann. Is Mus. r. Congo belge*, 4to (b) 3(2) 3: 65.

♂-Holotype (Dingila, Congo) and ♀-allotype (Eala, Congo) in Tervuren Museum.

Neurogomphus vicinus Schouteden, 1934, *ibidem* 3(2) 3: 66.

♂-Holotype (Kibombo, P. d'Or, Congo) in Tervuren Museum.

The type is teneral and badly stained. It is evidently only a variety of *uelensis* Schouteden, as previously recorded (Pinhey 1962 : 180).

Apart from the Congo, this species has been recorded from Turiani, Tanzania and from the Zambezi River, near the Victoria Falls. In the latter locality it has only been found in January and February, during the rainy season.

It is closely allied to *N. wittei* Schouteden but the outer antehumeral stripe is longer and there is a black band on the second lateral suture of the thorax.

Abdomen 39-42 mm, hindwing 31-33 mm.

Neurogomphus chapini (Klots), fig. 6

Oxygomphus chapini Klots, 1944, *Am. Mus. Novit.* 1259: 7.

♂-Holotype (Congo River) in the American Museum of Nat. Hist.

MALE: (Broderick Falls Escarpment, Western Kenya, May 1951, T. H. E. Jackson). Labium and ventral surface of occiput yellow; face and frons entirely green. Occipital plate darker and straight posteriorly.

Prothorax brown. Synthorax black to well below humeral suture, with green bands: on collar and two antehumeral stripes, one short and fusiform, the other a complete band. Side of thorax green with black stripes on first and second lateral sutures as in figure 6a. Femora ferruginous, tibiae and tarsi blackish.

Abdomen blackish dorsally, with green median band on segment 2 which has two swellings; base of abdomen greenish-yellow at sides; segments 8-9 orange laterally. Oreillet rectangular; accessory appendages as in figure 6d. Segment 10 constricted at base. Superior appendage with subapical latero-ventral tooth.

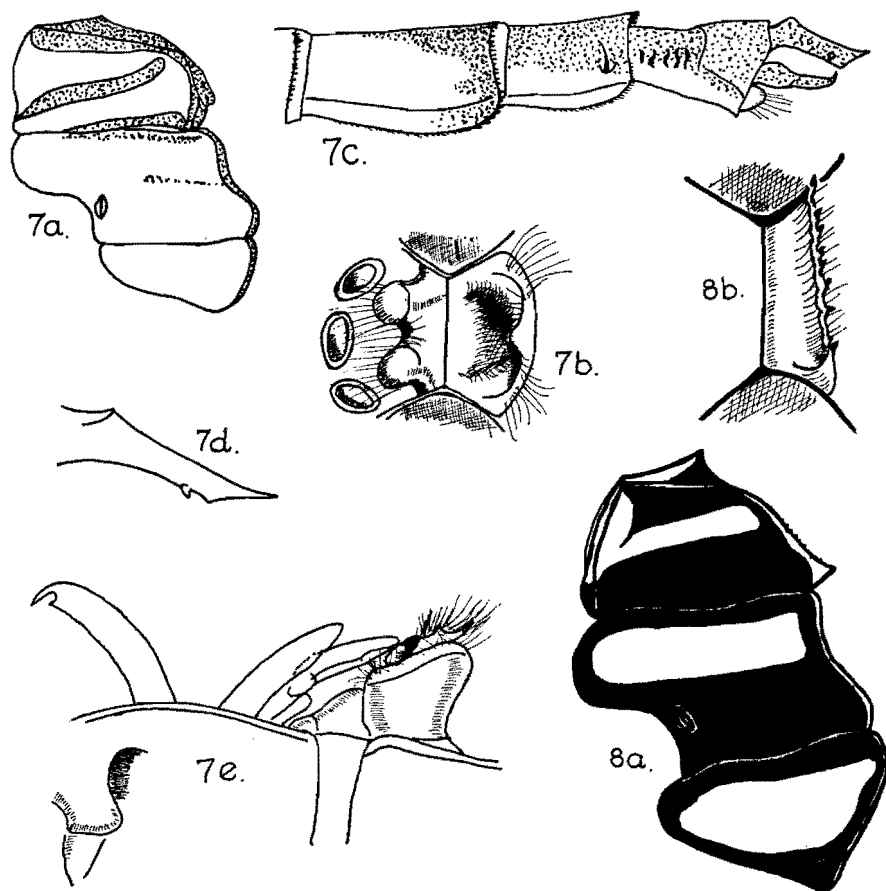


Fig. 7. *N. featheri* spec. nov., ♂-holotype (M'Gori River). (a) Synthorax. (b) vertex. (c) segments 8-10 of abdomen. (d) left superior appendage, side view. (e) accessory genitalia and oreillet.

Fig. 8. *Phyllogomphus schoutedeni* Fraser (Female, Zambezi River). (a) Synthorax. (b) occipital plate.

Pterostigma yellowish-brown between blackish veins. Wings faintly greenish from base to just beyond nodal level.

Abdomen 32.5 mm, hw 28 mm, pt 2.3 mm.

The above male was kindly presented to the National Mus., Bulawayo, by R. H. Carcasson.

Neurogomphus featheri spec. nov., fig. 7

Neurogomphus ? *wittei* Fraser, 1949, *Revue Zool. Bot. afr.* **42**: 133 (M'Gori).

♂-HOLOTYPE (slightly teneral): Labium ochreous, face and frons greenish-ochreous, without markings; ocellar region brown; vertex with paired tubercles with hirsute fringe, posterior to the ocelli. Occipital plate convex posteriorly but somewhat raised, especially in centre, the disc itself rather concave.

Prothorax greenish. Mesepisterna dark brown with two broad green, continuous antehumeral bands, united to one another at dorsal end and to mesothoracic collar at ventral end. Sides of thorax green to second lateral suture, with mere traces of brown, yellow below this suture. Bases of legs and inner surfaces of femora yellow, the legs otherwise dark brown.

Abdomen mainly blackish-brown. Segment 1-2 yellowish laterally, the hamules and oreillets also yellow; segments 3-7 with yellow middorsal line, incomplete at each end of the segments, with yellow lateral streak, becoming much shortened to a short yellow distal mark on segments 5-6 and barely traceable on 7. Segment 8 and the foliations mainly yellow with blackish distal triangle; segments 9-10 black dorsally, yellow laterally. Anal appendages blackish. Superior appendage with subapical lateral tooth.

Wings: venation brown; Pterostigma yellowish, short, between brown veins. Forewing with 13-14 Ax, the 1st. and 5th. primaries, and a basal subcostal cross-vein; 10 Px. Discoidal field of two rows, increasing subnodally. Anal loop on hindwing of one cell. Membranule very small, whitish grey.

Abdomen (without appendages) 35 mm, hindwing 30 mm, pterostigma 3.5 mm.

♂-Holotype: M'Gori River, Suna, South Kavirondo, Kenya, 7.IV.1931, W. Feather, in Royal Scottish Museum, Edinburgh (Morton Collection, 1940-41). The author is indebted to A. R. Waterston for the loan of this type.

The specimen also bears identification labels by Fraser: *Neurogomphus agilis* (Martin) ♂ and by the present author *Neurogomphus wittei* Schouteden. It is actually near *N. uelensis* and *N. wittei*, but smaller and with two complete antehumeral stripes unlike all the other species so far recorded. The outer antehumeral is as complete as in *N. chapini* (Klots), but in that species the two antehumerals are quite separate and the inner one is very short and fusiform.

In distribution it at least almost overlaps with *N. chapini* since both these occur in Western Kenya. It is a pleasure to name this species after Mr W. Feather who collected many interesting species in Eastern Africa, the most remarkable of his dragonfly discoveries being *Coryphagrion grandis* Morton (1924: 218).

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